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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
CARRILLO, BIBI SHARIDAN	

ART UNIT	PAPER NUMBER
1792	

MAIL DATE	DELIVERY MODE
07/29/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/523,371	SPIEGELMAN ET AL.	
	Examiner	Art Unit	
	Sharidan Carrillo	1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 May 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-5,8,9,11-15,36-38,40-47 and 49-52* is/are pending in the application.

4a) Of the above claim(s) *12,13,36 and 37* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-5,8,9,11,14,15 and 38,40-47,and 49-52* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☒ Claim(s) *1,3-5,8,9,11-15, 36-38, 40-47,and 49-52* are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 49 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 49 is indefinite because it is dependent on cancelled claim 48.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. The factual inquiries set forth in Graham v. John Deere Co., 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1, 3-5, 8-9, 11, 38, 41-47, and 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Somekh (6427703) in view of Wu et al. (6610123) and further in view of Alvarez Jr. et al. (6391090).

In reference to claims 1 and 46, Somekh teaches purging a lithography chamber with water vapor/oxygen containing compound to remove carbon contamination (Figs. 2a, 4) and removing the contamination with a vacuum pump (col. 5, lines 35-40, col. 6, lines 20-25). In reference to the limitations of a purge gas comprising oxygen and water, the teachings of adding water to the purge gas reads on applicant's claimed invention. Additionally, claim 2 of Somekh teaches water vapor doped oxygen compounds. Additionally, it is well known, as evidenced by Kern (Handbook of Semiconductor Wafer Cleaning Technology, 1993, pages 88-89), that oxygen gas contains a small concentration of contaminants such as water. Therefore, one would reasonably expect the oxygen gas of Somekh to include water vapor.

Somekh teaches the invention substantially as claimed with the exception of the temperature limitation of the purified purge gas. Wu teaches a method of removing contaminants from an enclosure during photolithography using a purge gas (col. 1, lines 5-10, clean dry air). In col. 3, lines 1-10, Wu teaches that the temperature of purge gas is set to ambient temperature +/-0.2 degrees centigrade in order not to damage the components present in the enclosure. It would have been obvious to a person of ordinary skill in the art to have modified the method of Somekh, to include the ambient temperature of the purge gas, as taught by Wu et al., for purposes of not damaging the components and also to provide the same ambient conditions as that of the photolithographic system.

Somekh in view of Wu et al. fail to teach purified gases having an AMC concentration level of less than 1ppb.

Alvarez Jr. et al. teach purification of gases used in photolithography in order to reduce the contamination level to 1ppb or lower (col. 7, lines 7-10, col. 8, lines 15-17) such that molecular contaminants on the optical components of the lithography tool is reduced. In col. 8, line 17, Alvarez teaches 100ppt.

It would have been obvious to a person of ordinary skill in the art to have modified the modified method of Somekh to include purification of the lens gases, as taught by Alvarez such that contaminants in the optical components can be avoided. In reference to claims 3-5, it would have been well within the level of the skilled artisan to repeatedly purify the gases until the desired level of contaminants of less than 1ppb or lower is achieved. Arguably, the skilled artisan would have recognized the advantages

of reducing the contaminants in the purified lens gases to values in the ppt range and/or close to zero. In reference to claims 8-9, Somekh fails to teach water in the gas of at least about 100 ppm. Alvarez teaches reducing the amount of water to as low as 10-100ppm.In reference to claims 11 and 38, refer to col. 6, lines 1-5 of Somekh. Re claims 41 and 49, refer to the teachings of Wu et al.

In reference to claims 42 and 46, Somekh in view of Wu and Alvarez fail to teach the purified gas removing AMC at a faster rate than the same method using nitrogen. However, since Somekh teaches contacting the substrate with water vapor, one would reasonably expect the rate of removal of AMC to be faster than nitrogen having no water present since Somekh is performing the same method steps using the same composition as instantly claimed and recited in the specification. The burden is shifted on applicant to show why the purge gases of Somekh would not produce a faster rate of removal of AMC, especially since the instant specification teaches increasing of the water content increases the removal rate. Re claim 43, refer to col. 6, line 24 of Somekh. Re claims 44-45 and 47, refer to the teachings of Wu et al.

6. Claims 14-15, 40, and 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Somekh (6427703) in view of Wu et al. (6610123) and Alvarez Jr. et al. (6391090), as applied to claims 1, 3-5, 8-9, 11, 38, 41-47, and 49, as described in paragraph 5 above, and further in view of Van Schaik et al. (6724460).

Somekh in view of Wu et al., and Alvarez fail to teach purging with an inert gas. Van Schaik et al. teach in-situ cleaning of optical components for use in a lithographic apparatus. In col. 4, lines 1-22, Van Schaik teach purging with nitrogen. Col. 8, lines 1-

5 teaches inert gases also include argon. It would have been obvious to a person of ordinary skill in the art to have modified the modified method of Somekh to include purging with an inert gas, since Van Schaik et al. teach it is conventional to purge with an inert gas in order to remove contaminants from the lithographic apparatus. Re claim 40, Van Schaik teaches 20% of oxygen (col. 9, lines 40-45).

7. Claims 1, 3-5, 8-9, 11, 38, 40-47, 49, and 51-52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Der Net et al. (US2005/0017198) in view of Alvarez Jr. et al. (6391090).

Re claims 1 and 51-52, Van Der Net teaches purging an optical component of a lithographic apparatus to remove contaminants with an ultra high purity gas comprising dry air in combination with moisture (paragraphs 43, 53). Furthermore, paragraph 43 teaches purified clean dry air. The limitations of oxygen are met since it is well known that a major component of air includes oxygen.

Re claims 1, 3-5, Van Der Net et al. fail to teach purification of the purge gas to less than 1 ppb. Alvarez Jr. et al. teach purification of gases used in photolithography in order to reduce the contamination level to 1ppb or lower (col. 7, lines 7-10, col. 8, lines 15-17) such that molecular contaminants on the optical components of the lithography tool is reduced. In col. 8, line 17, Alvarez teaches 100ppt.

It would have been obvious to a person of ordinary skill in the art to have modified the method of Van Der Net to include purification of the lens gases, as taught by Alvarez such that contaminants in the optical components can be avoided. In reference to claims 3-5, it would have been well within the level of the skilled artisan to

repeatedly purify the gases until the desired level of contaminants of less than 1ppb or lower is achieved. Arguably, the skilled artisan would have recognized the advantages of reducing the contaminants in the purified lens gases to values in the ppt range and/or close to zero. Re claims 8-9, Van Der Net teaches adjusting the moisture between about 0-100% (paragraph 55). Re claims 11 and 38, refer to paragraph 28, which teaches a wafer. Re claim 40, it is well known and conventional in the art that dry air comprises 20% by volume of oxygen, as further evidenced by Engineering Tool Box. Re claims 41 and 49, Van Der Net teaches purified CDA which reads on extra clean dry air. Re claims 42 and 46, Van Der Net in view of Alvarez fails to teach the purified gas removing AMC at a faster rate than the same method using ultra high purity nitrogen without water added thereto. However, since Van Der Net in combination with Alvarez teach contacting the substrate with purge gas comprising oxygen, wherein the purge gas has a certain concentration of water present, one would reasonably expect the rate of removal of AMC to be faster than nitrogen having no water present since Van Der Net is performing the same method steps using the same composition as instantly claimed and recited in the specification. The burden is shifted on applicant to show why the purge gases of Van Der Net, having a concentration of water present therein, would not produce a faster rate of removal of AMC. Re claim 43, refer to paragraph 43 of Van Der Net. Re claims 44-45, and 47, paragraph 49 teaches ambient conditions, which are no higher than 80C or no higher than 50C.

8. Claims 14-15 and 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Der Net et al. (US2005/0017198) in view of Alvarez Jr. et al. (6391090), as

applied to claims 1, 3-5, 8-9, 11, 38, 40-47, 49, and 51-52, as described in paragraph 7 above, and further in view of Van Schaik et al. (6724460).

Van Der Net in view of Alvarez fail to teach purging with an inert gas. Van Schaik et al. teach in-situ cleaning of optical components for use in a lithographic apparatus. In col. 4, lines 1-22, Van Schaik teach purging with nitrogen. Col. 8, lines 1-5 teaches inert gases also include argon. It would have been obvious to a person of ordinary skill in the art to have modified the modified method of Van Der Net et al. to include purging with an inert gas, since Van Schaik et al. teach it is conventional to purge with an inert gas in order to remove contaminants from the lithographic apparatus.

9. Claim 52 is rejected under 35 U.S.C. 103(a) as being unpatentable over Van Schaik et al. (6724460) in view of Alvarez Jr. et al. (6391090).

Van Schaik et al. teach in-situ cleaning by purging a lithographic apparatus with a purge gas composition. In col. 7, lines23-25, Van Schaik teaches the purge gas may contain one or a mixture of oxygen containing species selected from water, nitrogen oxides and oxygen containing hydrocarbons. Furthermore, col. 7, lines 40-45 teaches the addition of molecular oxygen and water to the purge gas. Also the abstract teaches molecular oxygen. Therefore, Van Schaik teaches a mixture of water and nitrogen oxides, which reads on applicant's claim language of water in combination with oxygen.

Van Schaik fails to teach purification of the purge gas to less than 1 ppm. Alvarez Jr. et al. teach purification of gases used in photolithography in order to reduce the contamination level to 1ppb or lower (col. 7, lines 7-10, col. 8, lines 15-17) such that

molecular contaminants on the optical components of the lithography tool is reduced. In col. 8, line 17, Alvarez teaches 100ppt.

It would have been obvious to a person of ordinary skill in the art to have modified the method of Van Schaik to include purification of the lens gases, as taught by Alvarez such that contaminants in the optical components can be avoided. In reference to "conditions that do not chemically change or alter the AMC", the limitations are met by Van Schaik because Van Schaik teaches removing hydrocarbons and other contaminants from the surface of the optical component. Van Schaik teaches that the purge gas is chemically altered by forming radicals, however the contaminants are removed and not chemically altered. Therefore, the limitations are met by the prior art.

Double Patenting

10. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., In re Berg, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); In re Goodman, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); In re Longi, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); In re Van Ornum, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); In re Vogel, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and In re Thorington, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

11. Claims 1, 3-5, 11, 14-15, 38, 40-41, 43-45, 49-50 and 52 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-4, 7, 9-14, and 20-23 of U.S. Patent No. 7189291. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims are directed to removing contaminants from a substrate using a purified purge gas comprising oxygen.

12. Claims 1, 3, 8, 11, 14-15, 38, 41-43, 46, and 49-52 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 6, 11-21, and 23-24 of U.S. Patent No. 7377982. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims are directed to removing contaminants from a substrate using a purified purge gas comprising water.

Response to Arguments

13. The rejection of the claims under 112, second paragraph is maintained in part for the reasons recited above.

14. The rejection of the claims as being unpatentable Somekh in view of Alvarez Jr. et al. is maintained. The secondary reference of Wu et al. is relied upon to cure the deficiency of the temperature limitation.

Applicant argues that Somekh requires the use of high energy to chemically transform the carbon deposits into gaseous entities and therefore, Somekh fails to teach the claimed temperature limitations. Applicant's arguments are unpersuasive because they are not commensurate in scope with the instantly claimed invention. Specifically, the

claims are not limited to the removal of carbon deposits. Furthermore, Somekh teaches that the purge gas can be activated by similar methods, and therefore not limited to only microwave or plasma source. Furthermore, there is no suggestion that thermal activation of Somekh would require a temperature outside of applicant's claimed range. Additionally, the secondary reference of Wu et al. is relied upon to teach purging at ambient temperature +/-0.2 degrees centigrade in order not to damage the components present in the enclosure and also to provide the same ambient conditions as that of the photolithographic system.

15. Applicant argues that thermal activation requires high temperatures, citing Exhibits A and B. The Exhibits are not persuasive because they are directed to different methodologies. Specifically, Exhibit A is incomplete because it only includes a technical discussion to an article directed to catalyst cartridges. Exhibit B is directed to a gravimetric method. Both exhibits are directed to different methods which are unrelated to a photolithographic process and a purge gas. Furthermore, applicant's arguments are unpersuasive because they are not commensurate in scope with the instantly claimed invention. The claims are not limited to a particular contaminant, flow rate, or other conditions cited in the exhibit.

16. Applicant further argues that Somekh teaches "removing deposits" which is different from the term "transferring". Applicant specifically argues that the contaminants on the surface are transformed into a different chemical entity that is subsequently removed. Applicant's arguments are unpersuasive since "transferring" by definition of Webster's dictionary, means "to carry or remove" and Somekh teaches

removal of the contaminants from the substrate surface. Applicant argues that the word "transfer" and "remove" are not synonyms. Applicant's argument is not persuasive based on the definition in Webster's Dictionary.

17. Applicant further argues that the secondary references of Alvarez and Van Schaik fail to teach the temperature limitations. The secondary reference of Wu is relied upon to cure the deficiency.

18. Applicant argues that Van Shaik fails to teach molecular oxygen. Applicant is directed to the abstract and col. 7, lines 40-45.

19. Re Van Der Net in view of Alvarez, applicant argues that the skilled artisan would not have been motivated to combine the references because Van Der Net teaches adding moisture and Alvarez states the importance of removing water. Applicant's arguments are unpersuasive because paragraph 55 of Van Der Net teaches that the purge gas can contain between 0-100 moisture and therefore the purge gas of Van Der Net could contain no moisture or water having concentration amounts in the ppm range. Alvarez clearly teaches that the lens gases conventionally have water present in the ppm range. Therefore, as one possible embodiment the purge gas of Van Der Net could have water in the ppm range.

20. The double patenting rejection is maintained. No new arguments have been presented.

21. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sharidan Carrillo whose telephone number is 571-272-1297. The examiner can normally be reached on M-W, F 6:30-5:00pm, alternating Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr can be reached on 571-272-1414. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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bsc